Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	**Comment on Multicast Feedback Operation over IEEE 802.16n**
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Re:	"IEEE 802.16-12-271," in response to Letter Ballot Recirc #37a on P802.16n/D2
Abstract	Comments on multicast feedback operation in GRIDMAN Draft Standard
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN
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Comment on Multicast Feedback Operation over IEEE 802.16n

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1. Introduction

Multicast feedback operation is description in IEEE 802.16n. However, retransmission is supported neither for multicast traffic nor multicast feedback due to following reason:

- multicast transmission is not only for single user

- code-only feedback does not have any information for which traffic

Thus, this document provides comments and clarification on operation of multicast feedback excluding retransmission in IEEE 802.16n.

2. References

[1] IEEE 802.16-12-0132, GRIDMAN System Requirement Document including SARM annex, January 2012.
[2] IEEE P802.16n™/D2, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, April 2012.
[3] IEEE P802.16.1a™/D2, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, April 2012.
[4] EEE P802.16Rev3/D6, IEEE Draft Standard for Local and metropolitan area networks; Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems," April 2012.
[5] IEEE P802.16.1™/D6, IEEE Draft for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, April 2012.

3. Proposed Text on the IEEE 802.16n Amendment Draft Standard

Note:

The text in **BLACK** color: the existing text in the P802.16n Amendment Draft Standard

The text in ~~**RED**~~ color: the removal of existing P802.16n Amendment Draft Standard Text

The text in **BLUE** color: the new text added to the P802.16n Amendment Draft Standard Text

[----------Start of Text Proposal----------]

[*Remedy1: Change line #20, page 57 on P802.16n/D2 as follows:*]

11. TLV encodings

11.1 common encodings

Change Table ~~660~~661 - Type values for common TLV encodings as indicated:

Type	Name
149	HMAC Tuple
148	MAC Version Encoding
...	....
127	MCID Continuity and Transmission Info
126	Bi-directional service flow
...	...
117	ABS information for direct HO
116	HR multicast service flow update mapping info

Insert the following at the end of 11.1 (renumbering may be required):

11.1.~~7~~717 HR multicast service flow update mapping info

[*Remedy2: Change section 11.3, page 51 on P802.16n/D2 as follows:*]

11.3 UCD management message encodings

11.3.1 UCD channel encoding

Add the table 675 the following

Name	Type (1byte)	Length	Value
N_SIZE_LOG	225	1	3 LSB Indicate the number of distinct sizes of logical channels, measured in terms of number of physical channels associated with them 5 MSBs are reserved and set to zero.
Physical_channel_count	226	1	3 LSB represent the base-2 logarithm of the number of physical channels in the logical channel 5 MSBs are reserved and set to zero.
N_OF_SIZE	227	1	12 LSB represent the number of logical channels with a specific count of physical channels in Physical_channel_count 6 MSBs are reserved and set to zero.
Frame_delay	228	1	2 LSB represent Delay in frames between starting frame for the reception of multicast and the first frame of the feedback channel associated with it. 0b01-1frame, 0b10-2 frames, 0b11- 3 frames and 0b00 - 4frames ~~(i.e. same frame in next superframe)~~ 6 MSBs are reserved and set to zero.
Ranging_method	229	1	1 LSB indicates the ranging method; 0b0: Initial ranging over two symbols, 0b1: BR/periodic ranging over one symbol. 7 MSBs are reserved and set to zero.
ranging_codes	230	1	2 MSB indicate index of starting code: 0b00: starting code index = 0 0b01: starting code index = 4 0b10: starting code index = 8 0b11: starting code index = 16 Next 6bits indicate number of code used Next 4bits indicate the spacing between codes used
Subchannel_offset	231	1	7 LSB indicate subchannel offset for ranging, counted from the beginning of ~~FCZ~~ assigned ~~for~~ UL 1 MSB is reserved and sets to zero.

[Remedy3: Change from line #15, page 55 to line #10, page 56 on P802.16n/D2 as follows:]

11.~~11~~13 Service flow management encodings

Insert the following rows at the end of ~~712~~713:

Table ~~712~~713 - Service flow encodings

Type	Name
58	Direct Communication
59	HR multicast service
60	HR multicast group zone identifier assignment
zz	Multicast Group ID
zz+1	Multicast Indication Cycle assignment
zz+2	Feedback request indicator
zz+3	Logical channel indicator
zz+4	Probability indicator of sending ranging preamble

Insert the following rows at the end of ~~713~~714:

Table ~~681~~714 - CC values

CC	Status
19	direct-comm-setup

~~11.13 Service flow management encodings~~

Insert the following new subclauses:

[*Remedy4: Change from line #20, page 57 to line #10, page 58 (11.13.51-11.13.54) on P802.16n/D2 as follows:*]

11.13.51 Feedback request indicator (FRI)

Type	Length	Value	Scope
[145/146].xzz+2	1	2 LSBs represent: 00-no feedback, 01-ACK only, 10-NAK only, 11-reserved 0x00: ACK only 0x01: NACK only 0x02-0xFF: Reserved and set to zero.	DSA-REQ/DSA-RSP/DSC-REQ

11.13.52 Logical channel indicator (FBACK_LCI)

Type	Length	Value	Scope
[145/146].(x+1)zz+3	2	12LSB Indicate the index of the logical channel assigned to this multicast 4 MSBs are reserved and set to zero.	DSA-REQ/DSA-RSP/DSC-REQ

11.13.53 Probability indicator of sending ranging preamble, (pi)

Type	Length	Value	Scope
[145/146].(x+2)zz+4	2	10LSBs indicate the probability of sending the NAK if NAK is indicated, probability = 2-pi2^{-pi} 6 MSBs are reserved and set to zero.	DSA-REQ/DSA-RSP/DSC-REQ

11.13.54 RNG-ACK parameters

~~Type~~	~~Length~~	~~Value~~	~~Scope~~
~~[145/146].(x+3)~~	~~2~~	~~First 4 LSBs: Delay in frames to retransmission, =0b0000 indicates no retransmissions~~ ~~Next 4 bits: Indicates maximum number of retransmissions if no RNG-ACK~~ ~~Next 4 bits: Indicates power difference in dB for retransmissions~~ ~~Last 4 bits: reserved.~~	~~DSA-REQ/DSA-RSP/DSC-REQ~~

[*Remedy5: Change from line #2, page 107 to line #35, page 108 (16.9.2.2) on P802.16n/D2 as follows:*]

16.9.2.2 Feedback for multicast information

To ensure robust multicast and provide the network operator with specific or statistical information of its reception a feedback operation is defined between an HR-MS that is an addressee of a multicast transmission and its serving HR-BS or HR-RS.

The conditions for providing feedback are defined by the network per each multicast channel and include positive feedback only (logical ACK), negative feedback only (logical NAK) or both (logical ACK/NAK). It is expected that all intended recipients of a multicast channel obey the same rules but those can be changed by the network. UL resources for the feedback are also provided by the HR-BS. ~~Feedback parameters may be unicast or multicast.~~

~~Feedback operation is supported by multicast addressees in connected as well as in idle states.~~

To set up feedback operation, the HR-BS shall include the ~~following parameters~~ logical channel assignment in ~~multicast setup~~ DSA-REQ, DSA-RSP and DSC-REQ.

~~If the above message is multicast then the HR-BS sends the HR-MS its logical channel assignment in a unicast message when setting up the multicast service.~~

The HR-BS may include the following in UCD:

The number of distinct sizes of logical channels, measured in terms of number of physical channels associated with them.

For each distinct size of logical channel:

- Log base 2 of the number of physical channel per logical channel
- number of logical channels of the size

The delay in frames between starting frame for the reception of multicast and the first frame of the feedback channel associated with it.

Sub-channel offset for ranging: Counted from the beginning ~~of FCZ~~ assigned ~~for~~ UL. ~~TBD.~~

Ranging method: initial or periodic

Initial ranging code: Indicates the CDMA codes used for initial ranging toward the forwarding HR-MS.

~~**16.9.2.2.1.1 HR-MS and HR-BS behavior**~~

~~The HR-MS shall:~~

If the HR-MS has been instructed to ACK (FRI=01b), then upon a successful reception of multicast transmission associated with the feedback channel the HR-MS shall send a ranging preamble as indicated in the setup parameters. If the HR-MS has been instructed to NAK (FRI=10b), and failed to receive multicast transmission when expecting one, ~~it shall toss a coin with probability p to determine if further action is needed.~~ the HR-MS sends a ranging preamble as indicated in the setup parameters based on the probability pi.

When transmitting ranging preamble, the HR-MS shall select at random a physical feedback channel out of all physical feedback channels associated with the logical feedback channel assigned to it. ~~(Note that it is possible for a logical feedback channel to include a single physical channel).~~

~~Determine an initial transmit power as for 802.16.Rev3 baseline.~~

Transmit the ranging preamble using transmit power, code and resource block as indicated from the physical channel parameters.

~~If the RNG-ACK is expected, the HR-MS attempts to detect RNG-ACK as for 802.16.Rev3 baseline.~~

~~If RNG-ACK is indicated and not received, the HR-MS shall retransmit at the next opportunity, stepping up its power as indicated. If there is more than a single physical channel associated with the logical channel, then the HR-MS shall randomly select a different physical channel for retransmissions. The HR-MS should repeat the retransmissions until RNG-ACK is received or until maximum reached.~~

~~The HR-BS shall:~~

~~If the HR-BS has indicated RNG-ACK then the HR-BS shall respond with RNG-ACK.~~

[----------End of Text Proposal----------]